



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.  | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------|------------------|
| 10/681,276   | 10/09/2003  | Takahiko Kawahara    | 33035M133            | 5971             |
| 441  | 7590        | 03/29/2005           |                      | EXAMINER         |
| SMITH, GAMBRELL & RUSSELL, LLP<br>1850 M STREET, N.W., SUITE 800<br>WASHINGTON, DC 20036 |             |                      | JACKSON, CORNELIUS H |                  |
|  |             |                      | ART UNIT             | PAPER NUMBER     |
|  |             |                      | 2828                 |                  |

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                      |                 |
|------------------------------|----------------------|-----------------|
| <b>Office Action Summary</b> | Application No.      | Applicant(s)    |
|                              | 10/681,276           | KAWAHARA ET AL. |
|                              | Examiner             | Art Unit        |
|                              | Cornelius H. Jackson | 2828            |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
   
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
   
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
   
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 09 October 2003.
   
 2a) This action is **FINAL**.                            2b) This action is non-final.
   
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-12 is/are pending in the application.
   
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
   
 5) Claim(s) \_\_\_\_\_ is/are allowed.
   
 6) Claim(s) 1-4 and 7-12 is/are rejected.
   
 7) Claim(s) 5 and 6 is/are objected to.
   
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.
   
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
   
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
   
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   
 a) All    b) Some \* c) None of:
   
     1. Certified copies of the priority documents have been received.
   
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
   
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)<br>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)<br>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date _____.<br>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)<br>6) <input type="checkbox"/> Other: _____. |
|--|---|

## DETAILED ACTION

### *Drawings*

1. Figures 1 and 7B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 13a and 13b. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) **not** mentioned in the description: 901 and 911. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al. (6542525). Regarding claim 1, Matsumoto et al. disclose a semiconductor optical device comprising **Fig. 9**: a semiconductor substrate **12** having a main surface; a stripe-shaped optical waveguide **96**, disposed on said main surface of said semiconductor substrate **12**, including an active layer **92**; a current blocking part **27**, disposed on said semiconductor substrate **12**, having said optical waveguide buried therein; a electrically conductive layer **28** disposed on said optical waveguide and current blocking part **27**; a first electrode **36** electrically connected to said semiconductor substrate **12**, and a second electrode **88** electrically connected to said electrically conductive layer **28**; and a trench **5** having a bottom in contact with said current blocking part **27**.

Regarding claim 2, Matsumoto et al. disclose wherein said current blocking part **27** includes a blocking semiconductor layer **22** comprising an InP semiconductor doped with Fe, **col. 11, lines 56-60**.

Regarding claim 3, Matsumoto et al. disclose wherein said blocking semiconductor layer **22** has a thickness of at least 1  $\mu$ m, **col. 9, line 42-44**.

Regarding claim 4, Matsumoto et al. disclose wherein said current blocking part **27** further includes a hole blocking layer **24** comprising an InP semiconductor of a conductivity type opposite from that of said electrically conductive layer **28**, **col. 7, lines 24-26**.

Regarding claim 7, Matsumoto et al. disclose further comprising an insulating film **32** disposed on a surface of said trench **5**.

Regarding claim 8, Matsumoto et al. disclose wherein said insulating film **32** comprises an insulating silicon compound, **col. 7, lines 32-34.**

Regarding claim 9, Matsumoto et al. disclose wherein said optical waveguide **96** comprises a first conductivity type semiconductor layer **90**, a second conductivity type semiconductor layer **94**, and an active layer **92**; said active layer **92** being provided between said first **90** and second **94** conductivity type semiconductor layers.

Regarding claim 10, Matsumoto et al. disclose a semiconductor laser device **80** comprising the semiconductor optical device according to claim 9.

Regarding claim 11, Matsumoto et al. disclose a semiconductor optical modulation device **2** comprising the semiconductor optical device according to claim 9.

Regarding claim 12, Matsumoto et al. disclose a semiconductor optical integrated device **Fig. 8** comprising: a semiconductor substrate **12** having a main surface, said main surface including a laser device region **86** and an optical modulation device region **82** arranged in a predetermined direction; a stripe-shaped first optical waveguide **96** longitudinally extending in said predetermined direction on said laser device region **86**; a stripe-shaped second optical waveguide **20** longitudinally extending in said predetermined direction on said optical modulation device region **82**; a current blocking part **27**, disposed on said semiconductor substrate **12**, having both of said first **96** and second **20** optical waveguides buried therein; a electrically conductive layer **28** disposed on said current blocking part **28** and first optical waveguide **96** on said laser

device region **86**; an electrically conductive layer **28** disposed on said current blocking part **27** and second optical waveguide **20** on said optical modulation device region **2**; a first electrode **36** electrically connected to said semiconductor substrate **12**, a second electrode **88** electrically connected to said electrically conductive layer **28** on said laser device region **86**, and a third electrode **3** electrically connected to said electrically conductive layer **28** on said optical modulation device region **2**; and a trench **5** extending in said predetermined direction along said first **96** and second **20** optical waveguides and having a bottom in contact with said current blocking part **5**; each of said first **96** and second **20** optical waveguides including a first conductivity type semiconductor layer **90/14**, a second conductivity type semiconductor layer **94/18a**, and an active layer **92/16**; said active layer **92/16** being provided between said first **90/14** and second **94/18a** conductivity type semiconductor layers.

#### ***Allowable Subject Matter***

6. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose the claimed invention was the specific Fe concentration.

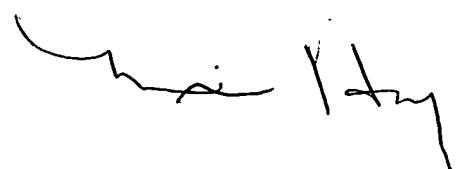
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cornelius H. Jackson whose telephone number is (571)272-1942. The examiner can normally be reached on 8:00 - 5:00, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
chj

  
MSH

MINSUN HARVEY  
PRIMARY EXAMINER